

ABSTRACT OF THE DISCLOSURE

One aspect of the present invention relates to a system and method for monitoring in-situ a chemical composition at or near a surface of a wafer during plasma etch to detect defects. The method involves the steps of providing a semiconductor substrate comprising at least one top layer, wherein the semiconductor substrate comprises at least one chemical-containing contaminant; subjecting the semiconductor substrate to a plasma etch process, whereby at least a portion of the top layer is removed; during the plasma etch process, detecting for a presence of the chemical-containing contaminant using one of an Auger Electron Spectroscopy system or Energy Dispersive X-ray Analysis system; and if present, determining whether the presence of the chemical-containing contaminant exceeds a threshold limit.